

REPORT OF A CASE OF EXSTROPHY OF THE BLADDER, WITH REMARKS UPON THE OPERATIVE TREATMENT OF THAT CONDITION.

By BRANSFORD LEWIS, M.D.,

OF ST. LOUIS,

PROFESSOR OF GENITO-URINARY SURGERY IN THE MARION SIMS COLLEGE OF
MEDICINE.

THE subject of this report is a man, aged twenty-seven, German, clerk. He has one brother and one sister, both of normal development. There is no other instance of genital abnormality in his family excepting in a female cousin, who is the subject, also, of complete exstrophy of the bladder. Singularly enough, these two, learning of each other's anatomical plight, and, no doubt, appreciating their inability to satisfactorily consort with normally-built individuals, agreed to marry, and are now living with one another as husband and wife. Needless to say, sexual functionation is an un hoped-for blessing in that family. The patient says that he sometimes has sexual desire, but is unable to gratify it in any satisfactory manner. He even has nightly emissions of an abortive kind, at times.

Examination reveals a reddish, globular mass, two inches in diameter, protruding from the pubic region, three-quarters of an inch above the general skin surface; it is covered with mucous membrane that is constantly moist and soggy, that is darker in hue than the normal bladder lining, and shows the effects of the irritation to which its abnormal position and surroundings subject it. Below this mass is the stump of a hardly-recognizable penis, that is broader than it is long, grooved along its dorsal aspect by a mucous-membrane-lined channel that is

evidently intended for the urethral floor, but under existing conditions cannot perform the office pertaining to that organ.

Between the penis and the projecting bladder-mass, palpation shows the symphysis pubis to be entirely lacking; there is a distance of at least two and three-quarter inches between the pubic rami. Instead of the natural pubic symphysis, covered with integument, the urethral groove extends uncovered directly up to the exposed bladder membrane. On each side of the junction of these two, at a distance from one another of three-quarters of an inch, are the two urethral openings, indicated by the periodical dripping of urine from them. There is no sign of an umbilicus.

The testicles are well descended, and occupy their natural position in the scrotum, the left hanging lower than its fellow. Prostate and seminal vesicles appear to be normal to rectal feel, though there is such tenderness of these parts that this cannot be precisely determined.

With the aid of a rubber receptacle, the patient has been able to catch and carry the urine as it emerges from the ureters, and, to a large extent, relieve himself of the contact of urine with the neighboring parts. He says that he does not suffer any actual pain on its account, and is able to undertake any kind of ordinary labor. Nevertheless, the urinous odor is always perceptible and oppressive; and it is clear that such an individual is especially liable to renal infection through the exposed urethral openings.

For the purpose of remedying this condition, great energy and enormous ingenuity have been displayed by surgeons. Simon, Pozzi, Czerny, Maydl, Sonnenburg, Segond, Murray, Harrison, Rutkowski, Fowler, Mundel, Trendelenburg, Wood, LeFort, Thiersch, Rydygier, Paucoast, Lloyd, and a host of others have tried their brains and their hands at discovering a mode of solving the problem. In the main, two classes of operative work have been undertaken,—one, by plastic manipulation, to make an artificial covering for bladder and urethra; the other, to divert the urinary channel either externally in a more suitable direction, or into the lower bowel with the purpose of making that the receptacle for the temporary retention of the urine. Of the first class, plastic work, Maydl's has been

the most favored procedure. It consisted in making flaps of integument from the adjacent belly-covering, turning them over the bladder membrane so as to make the skin surface the future mucous lining of the anterior wall of the artificial bladder. This operation had two advantages and two marked disadvantages: It furnished a covering for the exposed membrane and assisted in the easier disposal of the urine as it constantly flowed from the smaller opening. But it did not secure any additional retentive power to the bladder, did not furnish a sphincter for that organ, and the rubber receptacle was as necessary as ever; and the tegumentary surface in time grew the product natural to it, projecting hair into the artificial bladder, which became incrustated with phosphatic salts, caused decomposition and reawakened the old, sickening urinous odor, as well as numerous forms of irritation. Such patients had to be scraped out regularly to prevent prolonged spasmodic contractions of the rectum, to which the irritation gave rise.

Maydl's later suggestion (*Wiener medicinische Wochenschrift*, 1896, xlvii.) has proved much more efficacious. This consists in exsecting from the bladder-wall its trigone, together with both ureters, and implanting them into the sigmoid flexure of the colon; then cutting out the remainder of the bladder and closing up the resulting abdominal aperture. The urine then drained into the rectum, and there was no exposed tissue in the pubic area. The rectum acquired tolerance for the presence of the urine, as well as an ability to hold it for several hours.

The chief danger connected with this operation has been the tendency of infection to travel from the rectum up the ureters and involve the kidneys. The valvular effect of the obliquely-entering ureters has not always sufficed to prevent this. Nevertheless, some twenty-two cases have been operated upon in this manner, with three deaths, an exceedingly favorable showing for so radical and delicate an operation, and one that has been in use for so short a time.

To make the valvular effect of the ureteral openings more complete, Fowler (*American Journal of Medical Sciences*,

March, 1898) devised a special valve made from a tongue-like projection of rectal mucous membrane, and reported a case successfully operated on in that way, living and healthy two years thereafter.

On the strength of a remarkable experiment successfully executed by Tizzoni and Poggi in 1889, who, after cutting out the bladder of a dog, constructed a new bladder from membrane taken from the intestinal tract and then engrafted the ureters into it, making a working urinary receptacle, there has been on the part of some operators a reversion to the plastic method of remedying bladder exstrophy. Rutkowski argued (*Centralblatt für Chirurgie*, No. 16, 1899) that conservatism in surgery should not countenance the sacrifice of organs, as carried out in Maydl's transplantation of ureters and excision of the bladder; that the bladder should be utilized instead of being excised.

In the belief that the cause of former failure in supplying the anterior bladder-wall depended on the use of inappropriate material, skin instead of mucous membrane, which not only failed to afford contractile power because of lack of muscle-fibres, but became a source of irritation through the hair growing from it, Rutkowski made a flap from the small intestine, leaving attached to its mesentery and bringing it forward as a covering for the bladder; afterwards the abdominal walls were closed over the newly constructed organ. The patient, a boy twelve years of age, recovered, and became able to retain a small quantity of urine for an hour or so.

Ingenious as this procedure is, its result does not compare with those of Maydl above mentioned; and it is evidently of vastly greater difficulty in execution.

Of greater simplicity and markedly less danger is the plan of Mundel (*ANNALS OF SURGERY*, December, 1899), which consists in taking a bladder-wall from some animal, say a sheep, and engrafting it onto the lower fascia of the abdominal parietes, protected from the under side by gold-foil until it has become attached; then the newly-placed flap, with the skin

above it, is swung over the extruded bladder-wall and attached to the opposite edge.

This plan may seem a little fantastic, but its author reports success in carrying it out on a dog.

A procedure that, so far as I know, has not yet been carried out on the human subject, but has been successfully practised by its author, Dr. Jacob Frank, of Chicago (*Medical Review*, October 14, 1899), on several dogs, is that of vesicorectal anastomosis, effected by decalcified bone coupling, after the manner of intestinal anastomosis. The advantages claimed relate especially to the continued separation of the ureteral openings from the rectum, except by indirect connection through the anastomotic opening, which would obviate ascending ureteral infection. Of the fifteen dogs operated on by the author, ten recovered and five died. The dogs that recovered would at first hoist their legs as in their natural endeavor to urinate, and would then squat down and urinate from the rectum. This would be done periodically, the animals seeming to accustom themselves to the new order of things.

The author predicts that vesicorectal anastomosis will soon become the popular mode of procedure in relieving exstrophy; the anastomosis being made first, and the plastic operation later.

Another mode of making this diversion of the urinary stream into the bowel is that but lately executed by Carl Beck, of Chicago, reported in the *Chicago Medical Recorder* for November, 1899. The case was one in which there was tuberculosis of the bladder, for which cystotomy and curettement of the bladder had done no good. Later, after median incision, the ureters were cut off about an inch from the bladder-wall, and the ends picked up. A flap was made in the gut, consisting of peritoneum, subperitoneal and muscular tissue, leaving nothing but the mucosa and submucosa. The flap was turned back and the ureters carried beneath it. A small opening was made in the gut and the ends of the ureters carried through, leaving about one and one-half inches of the end hanging free in the lumen of the bowel. The ureters were placed one above

the other in passing through the bowel; while the flap held them in a sort of groove in the bowel-wall. The peritoneum below was sutured for a short distance.

The innovation introduced in this case, of leaving the ureter ends hanging free in the bowel, seems to have worked admirably. The patient recovered promptly, and five weeks afterwards was able to hold his urine four hours at a time. Another innovation, to which the operator ascribes much of the ability of the bowel to hold urine satisfactorily, was that of inserting the ureters into the sigmoid flexure instead of into the rectum. This, however, is in opposition to the views of Fowler, who made an instructive physiological observation in connection with the case of exstrophy upon which he performed transplantation. He noticed that while urination took place from the rectum at about the normal intervals, defecation likewise occurred at about the normal intervals, that is, once daily; and the movement was formed and not mixed with the urine or dissolved in it, as might be expected. In explanation, Dr. Fowler suggested that the normal accumulation of feces takes place above the sphincter of O'Bierne in the sigmoid flexure, not in the rectum, which is usually empty except at the time just before defecation. Therefore the rectum serves very well as a receptacle for the accumulation of urine, and the sigmoid for the accumulation of the feces. However this may be, the fact is established that the rectum takes on the function of a urinary receptacle with gratifying promptitude and ability.

In a personal communication to me regarding the present condition of his case, referred to above, Dr. Beck says, under date of February 23, 1900, "Referring to your inquiry concerning the patient with implanted ureters, he is perfectly well. He is attending to his work, comes to see me occasionally, about once a week. He urinates about every two hours, clear urine; defecates about twice in twenty-four hours. At night he gets up usually once to urinate; but if he wants to, he is able to hold his urine as long as six hours. I have told him not to do so, in order to avoid irritation of the rectal pouch. He is

gaining in weight, and every indication is present that he is cured, now about six months after the operation."

An impartial review of the results of surgical measures undertaken for the relief of vesical exstrophy, at the present day, can hardly fail to convince one that the nearest solution of the problem lies in the ureteral-transplantation and vesical-extirpation methods. Testimony to this effect is evident in the reports of those who have been most ardently in favor of autoplasmic methods, and have presented operative results successful in the highest degree of their expectations. For instance, we read the report of Küster (*Centralblatt für Chirurgie*, 1889, p. 533) of a case, a boy thirteen years of age, operated upon by Thiersch, by autoplasty. There were seventeen séances or steps to the operation before the cure was completed; and then, after the bladder had been covered and the flaps had grown together as the operator desired, he admits that the phosphatic incrustations on the hairs and irritation to which they led induced abscesses and fistulae that reacted onto the unsatisfactory urinary condition, establishing a vicious circle from which he was unable to extricate the patient.

Pozzi, in *Annales des maladies des organes genito-urinaires*, 1897, page 18, gives in admirable detail and with instructive drawings the steps by which he was able to completely cover the exposed structures of an exstrophy, and the photograph of the final result four months afterwards makes a good appearance; but at the same time we read in the context, "It is to be remarked that the perfecting of the final operation which closed the meatus and covered the ureters was followed by irritation quite active though temporary. The urine . . . provoked anew the signs of inflammation and pain. They were successfully combated with prolonged baths, vesical lavages with the double-current catheter, light cauterizations with silver nitrate, generous applications of vaseline; and it became necessary at one time to anesthetize the patient in order to clean out the new vesical cavity, which contained epidermal debris mixed with phosphatic deposits." Later this condition seems to have been ameliorated and, as the author says, "Con-

ditions were very satisfactory. There was a depth of eight centimetres to the bladder cavity, into which could be injected fifteen or twenty cubic centimetres of liquid before it would return; micturition was not painful, and one could note, at times, an interval of twenty minutes between urinations."

At the third session of the Association française d'urologie, October, 1898, there was a discussion by several of the members who had resorted extensively to autoplasmic methods. Pousson claimed the Sonnenburg method (the attachment of the ureter to the base of the penis, in the male; to the lower extremity of the abdomen, in the female; with extirpation of the bladder mucous membrane) to be the best, since it permitted the use of a urinal to good advantage, and placed the formerly exposed bladder membrane out of harm's way by doing away with it altogether. While M. Forgue, who had operated seven times on five children, admitted that a result ideal, even for this operation, was not always obtainable. "A bladder without capacity, a bladder-neck without a sphincter; in these we have the anatomical obstacles against which our attempts at bladder restoration clash. Whatever the operative asepsis, however exact the technique of our suturing, we bury in the depth of the tissues an infected organ, and are exposed, because of that fact, to interference with our lines of union." So that even those who have made most use of it can offer little hope from this means.

On the other hand, how different are the successes attained through the transplantation method. Success with it is not a mockery, not a failure! For instance, aside from the cases already mentioned, coming from German operators, the one operated upon by Dr. Dudley P. Allen, of Cleveland, and reported in the *Journal of the American Medical Association*, July 29, 1899, might be mentioned. The operation was done on a boy, November 3, 1898, and he was discharged from the hospital, well, on December 10, following. Since then he has been in excellent health (up to the time of last report); he has had no irritation of any sort from the retention of the urine

in the large intestine, he retains it without difficulty during the day, and from four to five hours during the night.

The vast difference between such a result as this, as compared with the best that the literature of autoplasty can show, is such as to leave no room for doubt. Pozzi's claim that in his successful case one could, at times, note an interval of twenty minutes between urinations, appears almost pitiful beside it.

Dr. E. Herczel, of Budapest, in the *Centralblatt für die Krankheiten der Harn und Sexual-Organe*, 1899, p. 563, reports the results of three cases of exstrophy upon which he operated after Maydl's transplantation method.

CASE I.—The first, a boy five years old, was operated on in May, 1897. In March, 1898, his condition was reported by the operator as admirable. Quantity of urine 1000 to 1200 cubic centimetres in twenty-four hours; specific gravity 1013; slight amount of albumen, no pus. The boy was able to hold the urine five hours at a time, and then to eject it in a good stream from the rectum. In August, 1899 (a year and a half after the operation), the condition continued as satisfactory. The patient, now a rapidly-growing and strengthening boy, enjoyed living, retaining his urine for six or seven hours during the daytime, but relieving himself oftener at night or running the risk of wetting the bed while in deep sleep.

CASE II. was a twenty-five-year-old man, and was operated upon December 20, 1897; convalesced satisfactorily, and soon acquired the ability to control his new urine receptacle. In June, 1898, he reported that he felt entirely well, held the urine for three hours, and had taken on considerable weight. Another letter, dated May, 1899, stated that he was free of any pain and felt entirely well; but that on experiencing cold he had to urinate oftener than at other times; also that urine escaped into the bed at times in his sleep.

CASE III., eleven-year-old boy; operation on March 9, 1899. Recovery without incident, and, at the time of making the report, a satisfactory condition.

In the June, 1899, number of *Revue Mensuelle des Maladies de l'Enfance*, Nové-Josserand reports a successful case

operated on after Maydl's plan. The operation required one hour and a quarter. In this case the patient was in a perfectly satisfactory condition three months afterwards. Urination occurred not oftener than every three hours, and there was no indication of any involvement of the kidney.

In the author's review of seventeen cases subjected to Maydl's operation, two deaths were recorded as attributable to the operation,—one from shock and the other from infection. The secondary accidents noted were fistulae of the urinary passages with an accompanying localized peritonitis, all of which cases recovered. Pyelonephritis, as the result of ascending infection, resulted in the death of one case after a period of four months. Urinary continence was perfect in all of the cases excepting two. The patients were able to hold their urine for at least three hours, sometimes for six or seven hours, and in one case throughout the night. The urine was voided sometimes mixed with faecal matter, sometimes alone. The tolerance of the rectal membrane was perfect.

The results of the transplantation methods for the operative relief of exstrophy, as indicated in the histories of cases so treated in the last five years, make an extremely favorable showing for them.